

MISCELLANEOUS NOTES ON NEOTROPICAL FLORA, XI

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The present notes include diagnoses or descriptions of new infraspecific taxa in genus *Espeletia*. For previous contributions, see *PHYTOLOGIA* 40(1): 25. 1978. The basic work for these notes was partially supported in the past by National Science Foundation Grant No. DEB72-01839.

ESPELETIA PYCNOPHYLLA var. *GALERANA* Cuatr. var. nov.

Caulirosula usque ad 4 m alta. Lamina foliorum oblongo-elliptica utrinque plus minusve attenuata apice acuta 22-30 cm longa, 4.5-8 cm lata, ratio 3-6:1, supra basim (1.5-)2-3 cm lata minima latitudine, nervis inter se 5-10(-12) mm distantibus, angulo 45-50° (-60°) ascendentibus, vagina 5.6 x 5.6 cm. Inflorescentiae quam in typo speciei breviores contractae, 25-35(-40) cm longae, parte floriferae 1/5-1/4 (vel 1/3) totius longitudinis, 5-7 capitula ferentes, internodia 8-3 cm longa, ramis monocephalis inferioribus 4-8(-12) cm longis, alteris 3-5(-6) cm, pedicellis ultimis 2-3 cm, pedicello terminali 2-3(-4) cm. Bractee subtendentes proximales 5-10(-13) x 1-2.5 cm, ceterae 3-6 x 1-1.5 cm. Indumentum illo typo simile sed praecipue sursum magis lutescente. Capitula 20-30 mm, circulo ligularum 30-35 mm, disco 16-17 mm.

Typus: COLOMBIA, Nariño: Macizo del Volcán Galeras, eastern slopes, paramo bushes 3900 m, caulirosula 2 m high, leaves yellowish white, ligules yellow, 7 Feb 1965, Cuatrecasas & Mora 26931; holotypus COL; isotypus US.

ESPELETIA PYCNOPHYLLA var. *LACINULATA* Cuatr. var. nov.

Lamina foliorum elliptico-oblonga apice subite angustata et apiculata, 46-52 cm longa, 10-14 cm lata, ratio 3.6-4.5:1, basim versus attenuata supra basim minima latitudine (2.6-)2.8-3 cm lata; margine in tertio inferiore usque ad 8 laciniis linearibus utroque latere, usque ad 3 cm longis, indumento incluso 4-8 mm latis, patulis numero et magnitudine asymmetricis, saepe aliquiis distalibus dentem brevem reductis; reliqua lamina marginibus subintegris vel irregulariter leviterque undulata interdum deorsum parvis dentibus brevibus 1-3 praedita; nervis secundariis 8-16 mm inter se distantibus angulo 45-50° ascendentibus. Inflorescentiae 64-50 cm longae, parte media vel tertia superiore fertili 9-13 capitula ferenti, 3-4 paribus paracladorum. Paracladia monocephala vel inferiora 12-17 cm longa bi-tricephala. Capitula

35-40 mm diam, circulo ligulari 38-47 mm, disco 18-20 mm diam in vivo; circa 290 flores ferentia; radiis 56, corolla 13.5-15 x 2-2.6 mm, tubulo 0.7-0.8 mm, flosculis disci 234, corolla 7.2-7.5 mm glabra.

Typus: COLOMBIA: Nariño-Putumayo: Páramo de Quilinsayaco, over the ridge of the Cordillera eastern side, 3200-3250 m, trunk 1.5 m tall, covered by marcescent leaves, habit whitish or greenish white, leaves up to 14 cm wide, with marginal lacinies in the lower third; all the leaves have these projections but this is the only individual with this feature in the population. Inflorescences greenish white or cinereous, ligules and disc corollas light yellow, anthers yellow, resin in translucent colorless tears, "frailejón," 21 Mar 1973, Cuatrecasas, Hernández & Estrada 28653; holotypus US; isotypus COL.

E SPELETIA PYCNOPHYLLA subsp. ANGELENSIS Cuatr. subsp. nov.

Caulirosula, caule simplici usque ad 7 m alto. Lamina foliorum oblongo-elliptica apice angustata acutaeque basim versus gradatim attenuata, 27-35(-40) x 5-8.5(-9.5) cm, basi minima latitudine (15-)20-40 mm lata, ratio 3.4-5.5(-6):1; nervis secundaris 5-8(-10) mm inter se distantibus, angulo 45-55° (-60°) ascendentibus; costa ad basim triangulata gradatim valde ampliata et in vaginam coriaceam producta. Vagina trapezoidali-oblonga, 5-7.5 x 5.5-6.5 cm, ad apicem cuneato-attenuata gradatim in laminam transiens; lamina utroque latere costae tota longitudine et parte distali vaginae decurrens marginem alatum gradatim angustatum usque evanescentem formans.

Inflorescentiae thyrsoides axillares rosula foliorum breviores vel aequilongae. Axis (26-)30-42(-50) cm longus robustiusculus striatus; pars vegetativa 16-30(-38) cm longa, saepius 2/3 longius quam parte fertili, saepe circa medium vel supra duobus foliis oppositis sterilibus sessilibus basi breviter connatis, (9-)11-18 x (1-)1.3-2 cm, oblongis attenuatis acutis munita, vel parte vegetativa exfoliata, nuda; pars florifera longi-bracteata plus minusve pyramidato-paniculata (8-)10-17(-24) cm longa, 5-11(-13) capitula ferens, tria in cyma terminali cetera in 1-3 paribus paracladiorum instructa, internodio proximali 4-13 cm longo, ceteris sursum gradatim brevioribus supremo 3-1.5 cm, pedunculo terminali 5-1 cm longo. Paracladia internodia excedentia, proximalia 4-13(-16) cm, sequentia 3-6 cm, sursum breviora, pedunculis supremis 1-3 cm longis, proximalia interdum 3-2 capitulifera cetera et saepe omnia monocephala. Bractee subdententes foliaceae saepe ramis pedunculisque longiores, proximales majores, lineari-oblongae attenuato-acutatae 6-15 x 1.3-2 cm, sequentes gradatim breviores elliptico-oblongae vel ovato-oblongae apice attenuato-acutatae, basi amplexantes vaginosae, sursum limbo gradatim reducto, supremae (5-)3.5-2.5 x 1.5-1 cm, adaxiale inferne glabrae vaginantes. Axis rami pedicellique dense crasseque albo vel ochroleuco-lanati pilis

circa 25 mm longis tenuissimis inferne plus minusve plurispiraliter contortis extremo moderate flexuosis vel rectis ad modum indumenti barbati insuper instructis. Bractee indumento similiter lanato-villoso et lanato-barbato sicut involucri albo vel moderate ochroleuco.

Capitula ligulis amotis 20-30 mm diametentia, 155-210 flores ferentia, circulo ligularum 30-36 mm, disco 14-16 mm diametro, involucri et circulo ligularum complanato 40-45 mm diam. Involucrum cupulatum (18-)20-22 mm altum, dense albo-lanato-barbatum. Phyllaria sterilia (5-)6-9, saepe dua exteriora opposita 28-26 x 21-12 mm, oblonga apice attenuata subobtusata vel subacuta, saepius dua vel quatuor 23-20 x 18-12 mm ovata vel oblonga obtusa vel obtusissima, altera 19-15 x 16-13(-10) mm oblonga obtusissima vel obtusa extus dense lanata. Phyllaria fertilia exteriora parca 13-10 x 7-3.5 mm herbaceo-chartacea, basi maturitate valde incrassata, elliptico-oblonga vel oblonga apice obtusa subite apiculata vel attenuata subacuta vel acutata extus lanuginosa, introrsum gradatim tenuiora angustioraque intima (10-)9-7.5 x 4-2.5 mm, membranacea oblongo-elliptica, oblongo-ovata vel elliptica, inferne amplectente apice acutata sparse lanuginea apice dorsale pilosula ciliataque pilis flexuosis 0.6-1 mm et raris vel haud glandulis. Receptaculum 14-16 mm diam, planum vel leviter convexum glabrum. Paleae 7-8(-8.5) x 1.8-3 mm scariosae hyalinae vel subhyalinae 7-9-nervatae amplectentes, ovaes, apice convexo angulata acutata interdum parce irregulariterque denticulatae dorsale minute lanugineo-barbato pilis flexuosis 0.2-0.5 mm et saepe parvis vel parvissimis glandulis sursum ad marginem.

Flores radii ligulati 3-seriati, 40-56 in capitulo. Corolla lutea, 11-16 mm longa, tubo 0.5-2(-2.5) mm longo incrassato dense minuteque crassi-piloso, pilis conicis crassis obtusis vel subobtusis 0.1-0.2 mm et parvis glandulis pediculati-capitatis 0.03-0.1 mm patulis inter-sparsis, lamina 2-3(-3.5) mm lata crassiuscula rigidula oblonga saepe sursum gradatim attenuata, apice minute 3(-2) dentata, abaxiale parvis glandulis inferne copiosioribus. Stylus erectus 6-8 mm ramis crassiusculis 2-2.2 mm longis. Achaenia externa 3-3.1 x 2-2.1 mm oblongo-obovata triangulata apice truncata basi attenuata obtusa dorso leviter convexo angulis argutis, intima 3.2-3.5 x 1-1.4 mm quadrangulata oblonga angulis 4 argutis vel dorsali subobtusata. Interdum achaenia breviora tantum 2-2.2 mm longa.

Flores disci 108-152 in capitulo. Corolla lutea 7-8.5 mm longa, tubulo 2.5-3.5(-4) mm longo, glabro vel sursum vel tantum apice parvis vel parvissimis pilis crassis subconicis obtusis 0.1-0.2 mm et parvis vel raris glandulis pediculati-capitatis ad 0.05 mm, limbo tubuloso glabro vel basi parvis vel raris pilis minutis et raris glandulis, lobis triangularibus circa 1 mm altis incrassatis dense papillosulis dorso glabris. Anterae (2.6-)3 mm longae, appendice ovata subacuta 0.5 mm longa. Stylus 7.5-8 mm. Nectarium 1 mm longum tubulosum extremo plus minusve profunde 5 dentato.

Typus: ECUADOR, Carchi: Páramo del Angel, 3400 m, 21 Jun 1939, Erik Asplund 7078; S, holotypus. Páramos del Angel, ca Voladero, 3825 m, caulirosula, largest one seen 3.45 m, with many flowering stalks, old leaves whitish, green felty with white hairs above, involucre bracts and flower stems very hairy, ligules yellow, 26-28 Sep 1959, Barclay & Juajibioy 9411; US, paratypus.

ESPELETIA PYCNOPHYLLA subsp. LLANGANATENSIS Cuatr. subsp. nov.

Caulirosula erecta usque ad 8 m alta. Lamina foliorum grandis sessilis elliptica utrinque paulo attenuata apice subacutata vel subobtusata, margine integra, 41-43 x 12.5-12.7 cm, ratio 3.2-3.4:1, basi usque ad 3 cm latitudine contracta, nervis secundariis circa 10 mm inter se distantibus angulo 60° ascendentibus, utrinque dense albo-lanata, insuper gossypino barbata, vagina deorsum gradatim ampliata.

Inflorescentiae thyrsoides axillares rosula foliorum plus minusve aequilongae. Axis in specimine unico 57 cm longus, crassiusculus, argute striatus; pars vegetativa circa 35 cm longa supra medium duobus foliis sterilibus oppositis sessilibus basi connatis, oblongo-ellipticis subacutis, 13-14 x 3-3.5 cm instructa, sectio basali 19 cm longa, internodio mediali 16 cm longo; pars fertilis circa 22 cm longa, 9 capitulis in panícula breviter pyramidali, tria in cyma terminali cetera in 3 paribus paracladiis disposita. Paracladia monocephala ad modum pedunculi, proximalia 17-18 cm longa cum bractea brevi (2.5-3 cm) infra apicem instructa, sequentia 11 cm, distalia 7 cm longa. Pedunculi cymae terminalis 3-5.7 cm longi, sicut paracladia, apice curvati capitula nutantia ferentes. Bractee subtendentes ellipticae quam ramis pedunculisque valde breviores, proximales 8 x 2.5 cm, sequentes sursum 5-3.5 x 1.5 cm, supremae circa 2.5 x 1.2 cm. Omnes partes axorum ramorum bractearum dense, valde crasse albo-lanatae lana crispa intricata ad superficiem longe barbata.

Capitula nutantia vel cernua circa 30 mm lata, 190-200 flores ferentia, circulo ligularum circa 35 mm, disco 17 mm diametro. Involucrum cupulatum dense crasseque albo-lanatum et barbulatum 22 mm altum. Phyllaria sterilia 8, crasse chartacea, dua exteriora 23 x 12 mm oblongo-ovata subacuta, altera dua 20 x 14-13 mm, oblongo-obovata vel oblongo-elliptica obtusa, cetera 19-18 x 12-9 mm, obovato-oblonga obtusaeque dense albo-lanata longeque barbata. Phyllaria fertilia exteriora 15-13 x 8-7 mm chartacea, oblonga vel obovato-oblonga subobtusata, obtuse angulata, basi incrassata, lanata vel lanuginosa, interiora 12-8.5 x 5-3 mm, tenuiora oblonga acutata, sursum paulo lanuginosa saltem apice barbulato pilis 0.5-1(-1.5) mm haud glandulis. Receptaculum planum, vel leviter convexum 14-15 mm diam glabrum. Palea 7-7.5 x 2.2-3 mm, ovaes, vel obovato-ellipticae apice angulato vel subobtusato, dorso subapicale barbulato pilis ochraceis flexuosis ad 1 mm longis, glandulis non vidi.

Flores radii ligulati circa 46 in capitulo corolla lutea 13-14 mm longa crassiuscula rigida, tubo 1.6-2 mm longo, incrassato copiose pilosulo pilis crassis subconicis 0.1-0.2 mm parcissimis glandulis pediculato-capitatis 0.05 mm interspersis, ad apicem adaxiale appendice ligulata ad 2 mm longa; lamina oblonga 2-3-dentata, 2.5-3 mm lata, 7-9 nervis subtus plus minusve conspicuis, inferne abaxiale sparsis pilis et parcissimis glandulis. Stylus 5.5-6 mm longis ramis circa 2 mm. Achaenia exteriora parca 3 x 2 mm late oblonga triangulata apice truncata basi paulo attenuata, dorso plano vel leviter convexo angulis argutis, interiora 3.8 x 1.2 mm oblonga quadrangulata, basi paulo attenuata.

Flores disci circa 146 in capitulo. Corolla lutea 8-8.3 mm, tubulo 3.7-3.8 mm, angusto, glabro vel raro apice parcissimis (1-2) pilis 0.1-0.3 mm longis, limbo tubuloso glabro, lobis triangularibus acutis 1 mm longis margine papillois, abaxiale glabris. Antherae 2.7 mm longae appendice apicali 0.5 mm longa. Stylus 8-9 mm. Nectarium tubulosum 5-dentatum 0.8 mm longum.

Typus: ECUADOR, Cordillera de Llanganates, near Las Torres, paramo, 3700-3800 m, 4 m high, flowers yellow, 23 Nov 1939, Erik Asplund 9944; S, holotypus.

ESPELETIA LOPEZII var. *ESCOBALENSIS* Cuatr. var. nov.

Lamina foliorum 26-35 cm longa, 5-7(-8.5) cm lata, oblonga vel elliptico oblonga, ratio 4-6:1, nervis secundariis angulo 45-60° divergentibus. Pseudopetiolus 4-7 cm longus, 1.1-1.4 cm minima latitudine. Vagina foliorum oblonga, 11-12 x 5-6 cm. Inflorescentiae 60-82 cm longae; pars fertilis 5-cephala, cyma terminali 3-cephala, pedicellis robustis 3-5 cm longis, internodio 7-16 cm longo, duobus pedunculis proximalibus monocephalis ascendentibus 5.5-14 cm longis. Bractae subtendentes proximales 10-15 x 2-3 cm, oblongo-acutatae, distales 6-7 x 1.3-1.8 cm longae. Capitula 3.5-4.5 cm diam in sicco. Corollae femineae 18 mm longae, tubulo 6-7 mm, copiose piloso, pilis patente-antrorsis acutis. Corollae masculae, 10-12 mm longae, tubulo 5-5.5 mm, limbo tubuloso lobis triangulari-oblongis, 1 mm longis extus glabris.

Typus: COLOMBIA, Boyacá: Páramo del Alto del Escobal, 3800 m altitude, on the old trail from Soatá to Cocuy, caulirosula 1-3 m tall, 8 Sep 1938, Cuatrecasas & García-Barriga 1236; US, holotype; COL, F, isotypes.

ESPELETIA HARTWEGIANA subsp. *CENTROANDINA* Cuatr. subsp. nov.

Lamina foliorum anguste elliptica vel anguste oblonga apice acuta, 20-30(-35) cm longa 2.6-5(-5.8) cm lata, ratio 5.5-8:1 (4.5-8.6:1), basim versus paulo attenuata, supra basim 1.5-2.6 cm minima latitudine, basi gradatim ampliata et in latam vaginam trapezicalem 5.5-7.5 x 5.5-8 cm latam producta; nervis secundariis

5-8(-10) mm inter se distantibus, angulo 50-60° (-75°) ascendentibus, utrinque indumento denso lanato et insuper dilute longeque sericeo-barbato instructo.

Inflorescenciae vulgo 8-14 in rosula quam rosula breviores vel aequilongae raro paulo longiores 23-45(-54) cm longae, parte vegetativa 1/2-2/3 totae longitudinis, 13-40 cm longa 1-2 paribus foliorum sterilium instructi uno semper circa basim inserto foliis quam internodiis (9-20 et 5-8 cm) valde longioribus, infimis (10-) 16-26 x (1-) 1.3-2 cm, lamina lineari subite acutata vagina 4-5 cm longa basi 1.5-2.5 cm longe tubulosa, alteris 9-14 x 0.8-1.5 cm lamina lineari vel lineri-triangulari vagina ampliata 4-4.5 cm longa tubo 2-2.5 cm longo. Pars fertilis 1/4-1/2 longitudinis in thyrso elongato (8-) 10-20 cm longo, 5-21 capitula ferenti instructa, internodiis sursum 5-7, 3.2-6.5 et 5-7 cm longis, ramis 1-4 paribus, inferioribus 3.5-13 cm longis, alteris 2-8 cm longis saepe monocephalis vel interdum uno vel duobus 3-2-capituliferis, cyma centrali pedicellis 1-5.5 cm longis; bracteae subtendentes inferiores 4-11 x 0.8-3 cm, lineari-triangulares basim magis ampliatis vagina ad 4 cm longa cum tubo 3 cm, alterae sursum gradatim breviores 3-6 x 1-2.5 cm, supremae 3-2.5 x 1.5-1 cm, etiam basi triangulares amplectentes. Axis folia bracteae rami pedicellique dense lutescenti vel aureo-lanati et copiose longeque barbati.

Capitula ligulis amotis 25-28 mm lata (in sicco), circulo ligularum 32-40 mm, disco 15-20 mm diametro. Phyllaria sterilia (6-) 10-14, exteriora praecipue 2 late lanceolata vel oblonga attenuata 31-25 x 10-7 mm, altera oblonga et late oblonga obtusiuscula 25-18 x 8-7 mm, omnia dense crasseque lanata, interiora 18-11 x 12-5 oblonga obtusa vel interna acutata. Phyllaria fertilia exteriora late oblonga vel anguste oblonga obtusiuscula (18-) 13-10 x (8-) 5-3.5 mm, lanata vel lanuginosa basi incrassata, altera attenuata acutata 11-8 x 3-2.5 mm rigidula, basi incrassata costa subcarinata eminenti dorso sparse lanuginoso-villosa. Receptaculum 12-20 mm diam. planum glabrum vel raris pilis. Paleae 8-10 x 2.3-3 mm, oblongae vel obovatae obtusiusculae vel acutatae subapice dorsale copiose breviterque lanugineo-villosae pilis 0.2-0.5(-1) mm.

Flores 183-284 in capitulo, radii 55-84, disci 128-200. Corollae femineae 12-16 mm, tubo 1.5-1.8(-2) mm pilosulo pilis crassis basi tuberculiformi 0.05-0.1 mm et parvis glandulis conicopediculatis capitatis 0.05 mm long; lamina elliptico-oblonga obtusa 2-3 mm lata 7-9 nervata, basi abaxiale minute pilosula et glandulosa. Achaenia marginalia 3-angulata 2-3 x 2-2.2 mm, interiora quadrangulata 3-3.2 x 1-1.2 mm. Corollae masculae 8-9 mm, tubo 3-3.5 mm apice sicut basi limbo parvis vel parcissimis pilis crassiusculis minutis 0.03-0.1 mm, lobis triangularibus 1-1.1 mm longis margine incrassato dense longeque papilloso, abaxiale glabris. Nectarium 0.6-0.9 mm.

Typus: COLOMBIA, Caldas: Cordillera Central, western slopes, SW drainage of Nevado del Ruiz, above El Aprisco, paramo 3600 m altitude, caulirosula, trunk 1-3 m high, 5 May 1940, Cuatrecasas 9312; holotypus, COL; isotypi, US, F. Tolima: Nevado del Tolima,

SE slopes at Las Mesetas 3600 m altitude, caulirosula 2 m high, 13 May 1932, Cuatrecasas 2869; MA, K, paratypes.

ESPELETIA HARTWEGIANA subsp. *BARRAGENSIS* Cuatr. subsp. nov.

Lamina anguste elliptica 28-36 cm longa 4.5-6.7(-7.2) cm lata, ratio 4.5-6.4:1, apicem versus angustata acutataque, basim versus gradatim attenuata et subite ad basim in ad modum pseudopetioli 9-11 mm angusti brevissimi (1 cm longi) contracta. Nervis secundariis 5-8(-10) mm inter se distantibus, angulo 50-60° ascendentibus, utrinque indumento dense lanato et insuper dilute sericeo-longi-barbato instructo. Vagina 6-7 x 6.5-7 cm, coriacea robusta subovata apice obtusiuscula et subite triangulata, abaxiale dense longissimeque lanato-barbata, ad apicem indumento crasse floccoso-lanato siccitate facile deciduo.

Inflorescentiae rosula foliorum breviores vel aequilongae, aspectu valde foliosae dense luteo-lanata et copiosissime aureo-barbata, 28-42 cm longae, parte vegetativa 2/3 totae longitudinis, 15-25 cm longa duobus paribus foliorum oppositorum basi ample vaginantibus; foliis internodia (6-15 et 7-13 cm) valde excedentibus, infimis 14-23 x 1.3-2.2 cm anguste oblongis acutis supra basim leviter vel haud attenuatis, vaginis 4-5 cm longis in tubo circa 1 cm longo coalitis intus glabris extus barbis longissimis (ad 30 mm) facile secedentibus vestitis, alteris 8-14 x 1-3 cm, vaginis 2-4 cm longis latissime amplexantibus basi tubo brevissimo (1 mm). Pars fertilis 1/3 totae longitudinis 10-20 cm longa simplice thyrsoidi 5-7 capitula ferens, internodiis 3-6 et 3.5-5 cm longis, ramis erectis monocephalis in 2-3 paribus dispositis, inferioribus 5-8 (-12) cm longis reliquis sursum leviter decrescentibus supremis 3-6.5 cm longis, pedicello centrali 3.5-5 cm, capitulis nutantibus 30-35 mm latis in sicco. Bractee subtendentes internodiis valde longiores, inferiores 5-10 x 1.5-2 cm, anguste oblongae acutae inferne dilatatae, vagina lata circa 3 cm longa basi breviter tubulata indumento aureo-lanato barbatoque facile deciduo, alterae bractee breviores magis ovatae vel triangulatae 3-7 x 1.5-2 cm, supremae 6-3.5 x 2-1.3 cm, vagina 2-3 cm.

Capitula ligulis amotis circa 35 mm lata (in sicco), circulo ligularum 35-40 mm, disco 19 mm diam. Phyllaria sterilia crasse lanata 13-14, tria exteriora 35-30 x 16-13 mm, elliptico-acutata, altera tria 25-22 x 12 mm obtusa, 4 sequentia 22-19 x 12-9 mm, interiora 17-15 x 8-7 mm elliptico-oblonga subacutata. Phyllaria fertilia 12-10 x 7-5 mm, anguste elliptica subacutata, coriacea vel subcoriacea basi indurata incrassata concava achaenia subamplexantia dorso villosa lanuginoso marginibus scariosis subglabris apice acuto, interiora apicale pilis paulo flexuosis erectis crassiusculis acutis 0.5 mm, sursum parvis glandulis 0.04-0.07 mm. Receptaculum 18 mm diametro planum parce pilosum pilis teneris erectis 0.5 mm. Paleae 10-11 x 3-4 mm, scariosae ovales acutae dorso subcoriaceae rigidae subnaviculares amplexantes basi induratae

8-10-nervatae apice sublanugineo-barbata pilis 0.5-1 mm et glandulis sparsis.

Flores circa 231 in capitulo radii 67, disci 164. Corollae femineae 11.5-15 mm longae, tubulo 0.8-1.2 mm, basim dense piloso pilis 0.1-0.3 mm, crassis obtusis et sursum sparsis glandulis subconicis vel cylindraceis capitatis 0.02-0.06 mm; lamina crassiuscula 2.2-2.5 mm lata, acute 2-3-dentata 5-7-nervata basim parce vel copiose glandulifera. Achaenia marginalia 3 x 2-2.2 mm, triangulata obovoidea basi acuta dorso modice convexo et tenuiter 2-3-nervato, angulis argutissimis subalatis, interiora 3-3.3 x 1 x 1.2-1.4 mm quadrangulata. Corollae masculae 8-10 mm longa tubo 3.5 mm apice sicut basi limbo parvis pilis obtusis brevibus crassis 0.2-0.4 mm et raris glandulis 0.05 mm, lobis triangularibus 1 mm altis marginibus incrassatis papillosisque, abaxiale glabris sed parvis glandulis obovoideis pediculatis 0.02-0.03 mm. Nectarium 0.9 mm altum tubulosum denticulatum.

Typus: COLOMBIA, Valle: Cordillera Central, western drainage, valley of Río Bugalagrande, Paramillo de Santa Lucía (= Páramo de Bavaya), 3680 m altitude, caulirosula, trunk 0.5-4 m high, rosette with whitish appearance, inflorescences yellowish, 16 Mar 1946, Cuatrecasas 20076; holotypus, COL; isotypi, F, P, US.

ESPELETIA HARTWEGIANA var. VEGASANA Cuatr., nov. var.

Lamina foliorum elliptica apice subite angustata acutataque, saepe apiculata, 26-27 cm longa 8.5-9.5 cm lata, ratio 2.7-3:1, basim angustata usque ad 2.2-1.7 cm latam contracta, nervis secundariis 6-11(-13) mm inter sese distantibus, angulo 50° (-55°) ascendentibus, utrinque dense lanata et copiose barbata. Vagina subovata crasse coriacea multinervata 6-7 x 6.5-8 cm, abaxiale dense adpresseque lutescenti barbata, apice sicut basi lamina dense longissimeque longi-barbata.

Inflorescentiae rosula foliorum breviores, dense foliosa et aureo-lanato barbata, 28-30 cm longa, parte vegetativa 1/3-1/2 totae longitudinis, 10-17 cm longa plerumque duobus paribus foliorum; foliis oppositis internodia (5-12 cm) excedentissimis, infimis circa 20 x 3-3.2 cm, lamina oblonga vel elliptici-oblonga deorsum leviter attenuata, basi longe lateque vaginatis, vaginis circa 6 cm longis in tubo 2.5-3 cm longo coalitis, abaxiale copiose longeque barbato-lanatis indumento facile separabili, foliis alteris anguste ellipticis circa 16-17 x 2.5 cm, ample vaginatis. Pars fertilis dense bracteata simpliciter thyrsoidea capitula 7-8 ferentia, internodiis 8-5.5 cm longis ramis plerumque in 3(-4) paribus, monocephalis sursum leviter decrescentibus, 8-4(-2.3) cm longis, pedicello terminali circa 3 cm. Bracteae subtendentes late foliosae elongato-ovatae amplectentes quam internodiis ramisque longiores, proximales 11-14 x 2.5-3.5 cm, vagina 4-5 cm cum tubo 0.6-3 cm longo, ceterae bracteae 13-7 x 2.5 cm, vaginis 2-5 cm tubo ad 2.5 cm, supremae 4 x 2 cm.

Capitula ligulis amotis 30-35 mm lata (in sicco), circulo ligularum 35-40 mm, disco 18-19 mm diam. Phyllaria sterilia crasse longeque lanata circa 10, saepe 2 exteriora obovato-oblonga attenuata 30 x 16 mm, altera dua 26 x 20 mm, elliptica obtusissima, sequentia 20-17 x 12-10 obovato-elliptica obtusa et saepe duo interiora 14-13 x 6 mm. Phyllaria fertilia exteriora 15-13 x 6-5 mm anguste elliptica obtusiuscula vel subite acutata pilis 1 mm, intricatis, interiora 11 x 2.5-3 mm scariosa obtuse angulata, 7-nervata apice barbulata, pilis 0.2-0.8 et parvis glandulis 0.05 mm. Receptaculum planum 12-13 mm diam. Paleae 10 x 2-2.5 mm, scariosae apice subcucullatae dorsale breviter barbulato-ferrugineae, 8-9-nervatae pilis subflexuosis acutatis 0.2-0.5 mm, interdum parvis glandulis interspersis.

Flores 270-280 in capitulo, radii 77-80, disci 200. Corollae femineae 14-15 mm longa, tubo 1-1.3 mm longo densissime piloso pilis brevibus vel brevissimis crassis obtusis 0.3-0.05 mm et glandulis conici-pediculatis sparsis. Lamina elliptico-oblonga obtusa 2.2-2.8 mm lata, abaxiale basi minute pilosa et parvis glandulis, ovaria marginalia 3 x 3.3 mm obovata triangulata basi acuta. Corollae masculae 9-9.5 mm, tubo 3-3.3 mm tantum apice sicut basi limbi parvis pilis brevibus crassissimis 0.1-0.2 mm obtusis et raris glandulis, lobis 1.3-1.4 mm longis triangularibus marginibus incrassatis papillois, abaxiale glabris. Nectarium 1.2 mm altum tubulosum dentatum.

Typus: COLOMBIA, Valle: Cordillera Central, west drainage, headwaters of Ríos Tuluá and Bugalagrande: Páramo de Las Vegas, 3800 m altitude, caulirosula with whitish appearance, inflorescences yellowish, trunk up to 1 m high, 22 Mar 1946, Cuatrecasas 20285; US, holotypus; COL, F, isotypi.

ESPELETIA HARTWEGIANA var. MORARUM Cuatr. var. nov.

Lamina foliorum anguste elliptica vel oblongo elliptica 27-34(-38) x 6-9(-10) cm, ratio 3.5-5:1 apice plus minusve subite acutata, basim usque ad 1.2-2.2 cm latam angustata, nervis secundariis 5-11 -m inter se distantibus, 40-55° (-60°) angulo ascendentibus, utrinque dense lanata et barbata. Vagina 5.5-7 x 5.5-7 (-8) cm ovato-oblonga apice obtuse attenuata.

Inflorescentiae 4-23 in rosula, folia paulo vel usque 1/3 illa longitudine excedentes, 42-63 cm longae, parte vegetativa 2/3-4/5 totae longitudinis, 33-48 cm longa, in 1/3 inferiore parte vel circa mediam tantum uno pare foliorum sterilium instructa, foliis linearibus vel oblanceolato-linearibus (10-)12-17 x (1-)1.5-2 cm, basi vaginatis amplexantibusque. Pars fertilis 1/5-1/3(-2/5) totae longitudinis, (6-)9-17 capitula ferenti, in panícula corymbiformi 10-20 cm alta instructa, interodiis sursum 3-8, 1.5-7 et 3-4 cm longis, 3-4 paribus ramorum oppositorum ascendentium, saepe duobus vel uno paribus proximalibus cyma 3-cephala instructis, ceteris ramis monocephalis, interdum ramis omnibus monocephalis;

ramis infimis 10-14 cm longis ceteris sursum gradatim decrescentibus, supremis 5.5-2.5 cm longis, pedicello centrali (terminali) (1-)2-5.5 cm longo, pedicellis secundariis (cymae lateralium) 1.5-3 (-5) cm longis. Bracteae subtendentes foliaceae lineares vel lineari-triangulares, proximales 6-8 x 1-1.8 cm basi ampliata amplectenti, alterae triangulares vel ovato-triangulares, 3-7 x 1-1.6 cm, ceterae sursum gradatim minores supremae 4-2.5(-1.5) x 1-0.7 cm. Inflorescentiae omnino dense luteo-lanatae longaeque aureo-barbatae.

Capitula 22-35 mm lata ligulis amotis, circulo ligularum 30-40 mm, disco 17-22 mm diam. Phyllaria sterilia 6-9, exteriora 3-5 dense longae lanata (24-)22-15 x 10-6(-5) mm, anguste elliptica acuminata vel acutata interdum subobtusata, interiora elliptico-oblonga vel oblonga (17-)15-10 x 8-4 mm, attenuata vel subite acutata dense lanata vel lanato-villosa. Phyllaria fertilia exteriora 11-7.5 x 6-4(-2.5) mm, anguste elliptica attenuata acuta vel acuminata basi incrassata, dorso lanata vel lanato-villosa pilis 1-2 mm longis, interiora 7-6 x 2.5-4(-5) mm teneriora concava semiamplectentia, elliptica vel subobovato-elliptica acuta, nervis crebris, dorso lanuginosa sursum barbata pilis 1.5-2 mm flexuosis et parvis glandulis, intima amplectentia tantum subapice dorsale barbata pilis 1-2 mm. Receptaculum 11-13(-16) mm, planum ad centrum convexum glabrum vel parvis vel parvissimis pilis. Paleae 6-7 x 2-3 mm scariosae basi incrassatae ovals subacutae naviculares amplectentes, nervis pluris 3-5 magis notatis, subapice dorsale barbata lanuginosa pilis brunnescentibus flexuosis erectis 0.5-1 mm et parvis glandulis 0.02-0.04 mm, interdum dorso secum costae pilosulae.

Flores 171-295(-324) in capitulo, radii 36-93, disco 135-218. Corollae femineae 10-14 mm longae tubo 0.5-1.4 mm dense piloso pilis crassis subconicis obtusis vel obtusissimis 0.1-0.5(-0.8) mm et parvis vel sursum raris glandulis capitatis 0.05-0.1 mm. Lamina crassiuscula elliptica vel anguste elliptica 2-3.5 mm lata, 2-3-dentata, 5-7-nervata, basi extus parce pilosula et parvis glandulis 0.05-0.07 mm basi conicis, interdum sursum etiam parvis glandulis. Achaenia marginalia 2-2.5(-3) x (1.1-)1.5-2 mm obovato-triangulata basi acuta callosa apice obtusa dorso convexo, interiora oblonga 2.2-2.5 x 1-1.1 mm quadrangulata. Corollae masculae 6-8 mm, tubo 2.2-3 mm longo angusto sursum et basi limbi parvis pilis crassiusculis obtusis vel attenuatis et acutis 0.05-0.3(-0.8) mm interdum parvis glandulis 0.04-0.07 mm; lobis triangularibus 1-1.2 mm altis margine incrassato longe denseque papilloso, abaxiale glabris. Antherae 2.3-2.7 mm longae basi sagittatae appendice apicali ovata subacutata 0.4-0.6 mm. Nectarium 0.7-0.8 mm tubulosum denticulatum.

Typus: COLOMBIA, Cauca: Cordillera Central, western drainage, Páramo de Moras, 3600 m altitude, caulirosula 1.4 m high with yellowish appearance, leaves greenish-cinereous, the indument light yellowish, hairs of the sheaths pale yellowish, inflorescences yellowish, surpassing a little the leaves, ligules bright yellow,

ligular circle 35-40 mm diameter, disc convex, 17-20 mm diameter, corollas yellow, pales brownish barbate, 19 Mar 1973, J. Cuatrecasas & Carlos Lehmann 28638; US, holotypus; COL, isotype. Id., Eastern drainage of Cordillera Central, Páramo de Moras, 3690 m altitude, caulirosula, trunk 60 cm high, rosette whitish-greenish-yellowish, inflorescences yellowish, surpassing the leaves, ligular circle 30-34 mm diameter, disc 15-17 mm diameter, trunk below the apex 4.5 cm diameter, resin dripping, hyaline, 19 Mar 1973, Cuatrecasas & Carlos Lehmann 28631; COL, US.

ESPELETIA SCHULTZII var. *BRACILOBATA* Cuatr. var. nov.

Lamina foliorum subobovato-oblonga subite acutata basim versus angustata, coriacea, crassa, albo lanato induta, 25-42 x 4-6 cm, supra basim ad 1.5-2.2 cm latam angustata, ratio 5-7.3:1, nervis secundariis plerumque angulo 50-55° ascendentibus, 6-8 (5-10) mm inter se distantibus, vagina 3-7 x 2.5-4 cm.

Inflorescentiae robustissimeae 80-120 cm longae, axe basi ad 2.5 cm diametro, 47-70 capitula ferentes, 5-6 paribus paracladiorum oppositorum plerumque ramosorum. Bractee foliaceae oblongo-ellipticae vel supremae oblongo-ovatae amplectentes, sed in 1-3 paribus proximalibus, bractea una vel ambae oblongo-obtrulatae profunde conspicueque 3-2 lobatae, 8-17 x 2.5-9 cm, lobis 1-6 cm longis centrali longiore lateralibus patulis.

Capitula ligulis amotis 20-25 mm ampla 371-387 flores ferentia, circulo ligularum 30-35 mm disco 16-18 mm diametro; flores radii 187-207, corolla lutea, 14-16 mm longa, tubulo 2-2.5 mm dense piloso et parce glanduloso, lamina lineari 0.8-1 mm lata; flores disci 180-184, corolla lutea 7.5-7.8 mm, tubulo 3 mm longo sursum minute piloso et parce glanduloso, limbo tubuloso-infundibuliformi dentibus triangularibus 0.7-0.9 mm longis acutis glabris. Receptaculum plano-convexum glabrum.

Typus: VENEZUELA, Trujillo: Paramito, above Jajó, towards Tuñame, rocky hills, 3100 m, trunk 20 cm, leaves very thick, soft and white, 29 Oct 1969, Cuatrecasas, Ruiz-Terán & López-Figueiras 28189; holotypus US; isotypus MERF. Los Pantanos near La Morita (Jajó-Tuñame), 2730 m, four specimens seen, near the road, 12 Jul 1971, Ruiz-Terán & López-Figueiras 2141; MERF, US, paratypi.

A very interesting variety characterized by having 1-3 pairs of bracts (both or one of each) deeply divided into 3 (or 2) triangular, patulous lobes, the medial longer. This feature has been observed by the author in several individuals at the collecting locality. Furthermore, the plants are unusually large with robust tall inflorescences, the heads having a glabrous receptacle and an extremely high number of flowers, from 370 to 387 of which 187 to 207 are ray-flowers. In typical *E. schultzii*, the number of flowers does not surpass 300, and the number of rays is no more than 120.

ESPELETIA SCHULTZII var. MUCURUBANA Cuatr. var. nov.

Forma a typica capitula minora magis numerosa, panícula magis ramosa pluris ramis ramulisque alternis, strictis, indumento brevior laxioreque differt. Lamina foliorum oblonga sursum leviter ampliata subite attenuato-acutata basim versus leviter attenuata, 29-31 x 4.5-5.2 cm, ratio 5.7-6.2:1, supra basim 2-2.4 cm latam maxime angustata, nervis 5-9 mm inter se distantibus, angulo 45-50° (-60°) ascendentibus.

Inflorescentiae ad 150 cm longae fulvescentes parte vegetativa 3 paribus foliis sterilibus oppositis, parte florifera 2/3 longitudine usque 30-90 capitula ferenti, paribus paracladiorum paucissimis, paracladiis singulis numerosis, 7-12, omnibus ramosis 1-12 capitulis ferentibus, ramulis alternis vel oppositis, breviter villosolano-lanuginosis, strictis erectis.

Capitula ligulis amotis 12-20 mm diametro, 114-154 flores gerentia, circulo ligularum 22-30(-35), disco 9-13 mm diam; flores radii 42-45, corolla lutea 8.5-12 x 1.3-1.8 mm, tubo 1-1.3 mm; flores disci 70-110, corolla disci 4.8-5.3 mm.

Typus: VENEZUELA, Mérida: Base of Cordillera del Norte, between Mucurubá and Páramo de Mucurubá; subparamo slopes 3200-3300 m, 20 Oct 1969, Cuatrecasas, Ruiz-Terán & López-Figueiras 28148; holotypus, US; isotypus MERF.

ESPELETIA SCHULTZII var. SUBPARAMUNA Cuatr. var. nov.

Lamina foliorum adulta subobovato-oblonga apice angustata acutata, deorsum attenuata, 29-42 x 5-9 cm, ratio saepe 4.7-6.5:1, usque ad minimam latitudinem 1.8-2.5 cm latam supra basim angustata, dense subadpresseque albo-lutescente lanata, nervis subparallelis magis regularibus 6-12(-15) mm distantibus, 50-65° ascendentibus. Inflorescentiae robustae usque 1½ m longae, 27-35 capitulis 2-3 paribus foliorum sterilium 1-3 paribus paracladiorum et 1-6 singulis paracladiis alternis. Capitula 20-25 mm diam, circulo ligulari 30-42 mm diam. Flores 250-363, ligulis 100-150 in capitulo.

Typus: VENEZUELA, Trujillo: Páramo de La Cristalina, 2500-2600 m, on open clearings between thickets of Andean forest, large rosettes of yellowish white habit, leaves coriaceous, thick and soft, erect, adaxially yellowish white-woolly, abaxially greenish except on veins, juvenile leaves and central bud yellowish white woolly, inflorescences several simultaneously curved-ascendent, ligular circle 42-35 mm, disc 16-15 mm diameter, 17 Feb 1973, Cuatrecasas, Ruiz-Terán & López-Figueiras 28557; holotype US; isotype MERF.

WERNERIA CRASSA Blake subsp. ORIENTALIS Cuatr. subsp. nov.

Rhizoma verticale, parvis ramis radiatis ascendentibus cum foliis marcescentibus longe fulvo-barbatis, imbricatissimis, densissime crasseque tectis, distale dense rosulato-foliatis, saepe in pulvinos aggregatis. Folia linearia 22-28 mm longa uninervia; lamina viridis anguste oblongolanceolata subacuta, crassa, 9-12 mm longa, 1.5 mm lata, basi sine sensu gradatim in vaginam longissimam transiens; vagina linearis 1-1.4 (basi -2) mm lata, crassa hyalina, in sicco scariosa, dorsale costa rigidula eminenti, marginale copiosissime longeque antrorso-fulvo-barbata.

Capitula terminalia solitaria folia suprema rosulata excedentia, pedunculo ca 10 mm longo sursum incrassato obconico, tenuiter lanuginoso. Involucrum 13-15 mm altum viride, praeter basim leviter lanugineum glabrum. Phyllaria 13 crassiuscula inferne in tubum 6-7 mm longum connata, parte libera lanceolato-oblonga attenuata acutiuscula 7-8 x 2-2.2 mm, crassiuscula margine anguste scariosa apice minute papilloso-ciliata. Flores radii 13 ligulata; corolla alba glabra 14-15 mm longa, tubulo 3.6-4 mm longo angusto; lamina 2-2.3 mm lata, oblonga obtusa deorsum angustata, 4(-5) nervata. Stylus 6 mm, ramis crassis 1.2 mm longis, apice obtuso papilloso-stigmatico. Ovarium tenuiter 5-7-nervatum. Flores disci 48; corolla lutea glabra, 7 mm longa, tubulo 3 mm, limbo tubuloso 4 mm, lobis crassiusculis 1-1.2 mm longis. Antherae 1.5 mm longae; collum filamentum incrassatum 0.5 mm longum. Rami styli 1 mm apice truncato stigmato-papillato. Achaenia 3 mm longa. Pappus 5-6 mm longus stramineus setis strigosis pluriseriatis basi in callum annularem coalitis.

Typus: COLOMBIA, Cordillera Oriental, Alto del Almorzadero, vert. N, 3700-3800 m altitude, swampy paramo, rosettes caespitose, rays white, 28 Nov 1941, Cuatrecasas 13511; US, holotype; COL, F, isotypes. Other collections: Boyacá, Sierra Nevada del Cocuy, 4000-4300 m, 12 Sep 1938, Cuatrecasas & García 1486 (COL, US, F), 1516 (F); id., up to 4415 m, Cleef 8597 (U), 8736, 8762, 5784 (US).

This ssp. orientalis has the same habit as the ssp. crassa, but it differs basically from it in the smaller size. Its leaves are shorter and narrow, 20-30 mm long (25-50 mm in ssp. crassa); the involucre is narrower and shorter (up to 18 mm high in ssp. crassa), having 13 phyllaries instead of 19 as in crassa; the number of ray flowers is only 13 (in ssp. crassa 19-20), the ligules being shorter (10-11 mm in ssp. crassa); the disc corollas (7 mm) are also smaller than in ssp. crassa (8-11 mm). Subsp. orientalis represents the species in the Eastern Cordillera of Colombia, being characteristic of some very wet and swampy paramo meadows of high altitude.